Amendment to the Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application.

1. cancel

2. (currently amended) The method of channel estimation according to claim ~~1~~ 7, wherein said step of performing channel coefficient estimation for substantially each of said plurality of frequency domain sub-carriers uses channel coefficient estimation benefits from said channel coefficient estimates for substantially all the other frequency domain sub-carriers of said plurality of frequency domain sub-carriers.

3. (previously presented) The method of channel estimation according to claim 2, wherein said plurality of frequency domain sub-carriers comprises substantially all the sub-carriers of said frequency domain signal.

4. canceled

5. (currently amended) ~~The method of channel estimation according to claim 1,~~ A method of channel estimation in a wireless orthogonal frequency division multiplexed (OFDM) communication system, comprising the steps of:

receiving a signal in time domain; applying a Fourier transform to said received signal to obtain a frequency domain signal including a plurality of sub-carriers;

estimating probabilities of coded bits for at least said plurality of frequency domain sub-carriers;

performing channel coefficient estimation for at least said plurality of frequency domain sub-carriers using channel coefficient estimates for at least one other of said plurality of frequency domain sub-carriers; and

repeating said steps of estimating probabilities and performing channel coefficient estimation so as to improve iteratively an accuracy of said channel coefficient estimates and wherein the step of performing channel coefficient estimates comprises replacing previously estimated channel coefficients of said plurality of frequency domain sub-carriers with respective current channel coefficient estimates

wherein a kth channel coefficient estimation is substantially in accordance with the following equation:

$$H_k^{(p+1)} = \frac{\mathrm{P}\left(y_k \middle| x_k, H_k^{(p)}\right)\left[y_k \overline{x_k} - \sigma^2 \left(\Delta^{-1}\right)_k \widetilde{H}^{(k)}\right]}{\mathrm{P}\left(y_k \middle| x_k, H_k^{(p)}\right)\left[|x_k|^2 - \frac{\sigma^2}{\upsilon^2} + \frac{\upsilon^2}{\gamma^2}\right]}$$

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where $H_k^{(p+1)}$ is the (p+1)th estimate and $H_k^{(p)}$ the pth estimate of the channel coefficients, y_k is the received data corresponding to the transmitted data x_k, σ^2 is the channel noise variance, {tilde over (H)}$^{(k)}$ is the channel coefficient vector H with a 0 on the kth component and Δ^{-1}, ν^2 and γ^2 have the meanings indicated hereinabove.

6. canceled

7. (currently amended) ~~The method of channel estimation according to claim 1,~~ A method of channel estimation in a wireless orthogonal frequency division multiplexed (OFDM) communication system, comprising the steps of:

receiving a signal in time domain; applying a Fourier transform to said received signal to obtain a frequency domain signal including a plurality of sub-carriers;

estimating probabilities of coded bits for at least said plurality of frequency domain sub-carriers;

performing channel coefficient estimation for at least said plurality of frequency domain sub-carriers using channel coefficient estimates for at least one other of said plurality of frequency domain sub-carriers;

repeating said steps of estimating probabilities and performing channel coefficient estimation so as to improve iteratively an accuracy of said channel coefficient estimates and wherein the step of performing channel coefficient estimates comprises replacing previously estimated channel coefficients of said plurality of frequency domain sub-carriers with respective current channel coefficient estimates; and

wherein repeating said step of performing channel coefficient estimation comprises applying a cost function on an Expectation-Maximization algorithm on said plurality of frequency domain sub-carriers to improve said channel coefficient estimates.

8. cancel

9. (currently amended) A method of channel estimation in a wireless orthogonal frequency division multiplexed (OFDM) communication system, comprising the steps of:

receiving a signal in time domain;

applying a Fourier transform to said received signal to obtain a frequency domain signal including a plurality of sub-carriers;

estimating probabilities of coded bits for at least said plurality of frequency domain sub-carriers;

performing channel coefficient estimation for at least said plurality of frequency domain sub-carriers using channel coefficient estimates for at least one other of said plurality of frequency domain sub-carriers; ~~and~~

repeating said steps of estimating probabilities and performing channel coefficient estimation so as to improve iteratively an accuracy of said channel coefficient estimates; and

wherein said step of performing a channel coefficient estimation comprises applying a forward-backward algorithm on said received signal to said plurality of channel coefficient estimates in which estimates are made in a first order of said plurality of frequency domain sub-carriers and subsequently estimates are made in a reversed order of said plurality of frequency domain sub-carriers so as substantially to equalise an estimation accuracy across said plurality of frequency domain sub-carriers.

10. (previously presented) A system for channel estimation in an orthogonal frequency division multiplexed (OFDM) receiver, the system comprising:

demodulation means for applying Fourier transform to a received signal to obtain a frequency domain signal including a plurality of sub-carriers;

decoding means for decoding the received signal and estimating probabilities of coded bits for at least said plurality of frequency domain sub-carriers;

channel estimation means for performing channel coefficient estimation for each of said plurality of frequency domain sub-carriers using channel coefficient estimates for at least one other of said plurality of frequency domain sub-carriers; and

the decoding means and channel estimation means estimating probabilities and performing channel coefficient estimation so as to improve iteratively an accuracy of said channel coefficient estimates by replacing previously estimated channel coefficients of said plurality of frequency domain sub-carriers with respective current channel coefficient estimates.